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ABSTRACT

Project CDCC (Career Development Centered Curriculum) provides career development instruction to rural, elementary-level students. The objectives are to help students demonstrate increased awareness of life roles, formulate realistic self-concepts, and develop and use decision-making skills. Through a process which included testing and refinement, twenty-seven units containing 141 performance objectives were developed to integrate career awareness into existing subject material. The units include learning and practice in math, communication arts, science, and social studies; they employ various teaching strategies and techniques, such as activity sheets, classroom discussion, audiovisuals, role playing/simulation, and field trips. The materials were pre- and posttested using (1) a field test site (up to four years of student exposure and units taught between testing periods), (2) an experimental site (one year of student exposure and units taught between testing periods), and (3) a control site (units not taught between testing periods). There were substantial posttest performance differences between experimental groups and the control group in favor of the former. Also, greater results were shown at any grade level if the students had taken the CDCC units at lower level. Educational assessment data indicated that implementing career education activities did not hurt academic achievement. (CSS)

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PROJECT CDCC

Coloma Community School District
Coloma, Michigan

A Submission to the
Joint Dissemination Review Panel

Carol B. Kaplan
American Institutes for Research

28 February 1978

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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CE 020 072

PROGRAM AREA: Career education

ACTIVITY TITLE, LOCATION: Project CDCC (Career Development Centered Curriculum) Coloma, Michigan

DEVELOPED BY: Coloma Community School District

SOURCE AND LEVEL OF FUNDING: ESEA Title III $440,395 (total for all years)

YEARS OF ACTIVITY DEVELOPMENT: 1972-76

BRIEF DESCRIPTION OF ACTIVITY

Project CDCC utilizes a unit approach to provide career development instruction to rural students at the elementary level.

Goals and Objectives

The major project goal is to enhance the career development of elementary students by building specially developed curriculum units into the existing educational program.

The major project objectives are that students will:

- demonstrate an increased awareness of life roles;
- formulate realistic self concepts; and
- develop and use decision-making skills.

Claims of Effectiveness

It is claimed that utilizing the CDCC curriculum units will increase students' awareness of life roles; help students formulate realistic self concepts; and help them develop and use decision-making skills.

Context and Students Served

Coloma is a rural community in southwestern Michigan; it covers 53 square miles and has a population of approximately 12,000, comprised primarily of middle-class families. A large segment of the parents are employed in businesses and industries related to agriculture.

The school district is composed of the following ethnic groups: Native American--2%; Black--.2%; Asian American--.3%; Latin American--1.5%; White--96%. The three elementary schools have 1,600 student participants in the project enrolled in grades K through 6. The average class size is 24. The average per-pupil expenditure for regular school programs was $1,224 during the 1975-76 school year the year upon which this document focuses.

Activity Description

During the four-year development and pilot/field testing period, Project CDCC staff consisted of a project director, an assistant director, and a project coordinator. An evaluator was hired on a contract basis.

After studying writings on career education by national educational leaders, a local committee representing parents, teachers, administrators, and students provided input for the original proposal that resulted in project funding. Local needs were identified using 1970-71 state assessment scores, local career awareness check lists, and other local data. The development of special curriculum units to integrate career awareness with existing subject matter was the strategy adopted to meet identified local needs.

The CDCC Program Model. As a result of the needs assessment, project staff and teachers in the Coloma Community Schools conducted an extensive search of the literature to identify elements in the career development process. Three major ideas emerged from that search, and they form the basis of the CDCC Program Model: (1) students need to become aware of and understand a variety of life roles people play in our society; (2) they need to understand themselves--their values, interests, and aptitudes; (3) they need decision-making skills and practice in putting together these two understandings so that, as they move through their secondary and post-secondary education, they can implement their career plans based on sound decisions rather than chance. These three ideas were translated into the following student objectives:

Objective 1: Demonstrate an Increased Awareness of Life Roles. The various careers which people may follow during their lives are the central focus of this objective. The Program Model includes an occupational clustering system. The following 12 career clusters, which are those addressed by the program, resulted from a review of materials from the Cobb County, Georgia project and from the Mesa, Arizona public schools project, with several adaptations made by the project director:

- Natural resources
- Manufacturing
- Construction
- Technology and research
- Arts and entertainment
- Business, sales, trade, finance
- Clerical
- Transportation and communications
- Public service
- Personal and product service
- Hospitality and recreation
- Health

Objective 2: Formulate Realistic Self Concepts. The Program Model also includes career development tasks. These tasks describe the sequential components of an individual's career development. The development tasks emerged from the literature review conducted early in the project; they represent a synthesis of the various theoretical constructs exemplifying "healthy" career development. Following are examples of career development tasks which the project aims to help students accomplish:

- Grades K-3 (Fantasy period) -- Children make unrealistic choices based on dreams and wishes. (Teachers and parents should readily accept unrealistic statements.)
- Grades 4-6 (Late fantasy period, early tentative period) -- Children should be helped to see that there are still a number of years before career plans must be set.
- Grades 7-9 (Tentative period) -- The individual begins to recognize the problem of career choice; decisions are tentative but more realistic.

Objective 3: Develop and Use Decision-Making Skills. A list of themes was generated to clarify the intent of each of the three objectives. For example, these three themes clarify the intent of the decision-making objective:

1. The student will set personally relevant goals as part of decision making.
2. The student will identify and use information about self and life roles as part of decision making.
3. The student will understand decision making as identifying alternatives, selecting the alternative most consistent with goals, and taking steps to implement a course of action.

Achievement of this objective is viewed as laying the groundwork for students to be able to set and achieve individual educational and career goals.

Program Development. The program development process consisted of combining occupational clusters, career development tasks, and career development themes with the existing elementary curriculum to develop specific career education units.

To develop a program that would be feasible for teachers to implement, Coloma project staff and teachers followed a cyclic mode of developmental activities. Each year, over a period of three years, curriculum units were written, implemented in classrooms, evaluated, and revised. More specifically:

- In the first project year (1972-73), units were pilot tested in approximately three classrooms per grade level in one school. The same teachers who developed these initial units implemented them in their classrooms.
- In 1973-74, the units were revised on the basis of the '72-'73 data and were field tested in all classes in Coloma's three elementary schools.
- Further field testing was done in 1974-75; the units were again revised, on the basis of the '73-'74 results, and implemented in all three schools.

This continuous refinement process allowed modifications, deletions, and additions to each unit each year. The resulting products comprise a comprehensive, articulated career development curriculum for K-6 students. The 27 units (four for each of grades K-5 and three at the sixth grade level) include learning and practice in math, communication arts, science, and social studies; they also convey the career development aspects of an individual's growth. A unit is implemented for approximately two instruction hours per day for a period of two to three weeks. One unit is taught during each nine-week grading period at each grade level.

The units employ a variety of teaching strategies and techniques, including the use of activity sheets, classroom discussion, and audiovisual materials. Techniques that are particularly effective for career development are presentations of role models, role playing/simulation, and field trips. The following are sample unit titles for grade level 3: Dairy Industry, Responding Behavior, Restaurant Industry, and Airline Workers.

Staff development activities consist of a two-day training session covering the following topics: (1) self-awareness for teachers; (2) career awareness for teachers; (3) career development and the elementary student; (4) using the CDCC units in the classroom; (5) utilizing role models, role playing,and field trips as instructional strategies; (6) planning for unit implementation; and (7) the teacher's role in evaluating program impact.

Costs

The 1972-76 budget for this project was $440,395. The program served a total of 5,800 pupils during the four years for an average cost of $75.93 per pupil-year. Costs for salaries included the project director, assistant director, and project coordinator. The school district provided office space for these personnel as well as telephone use. The table on the next page presents costs for project installation and for subsequent years.

EVIDENCE OF EFFECTIVENESS

Evidence of Impact. Each of the project's three student objectives has been elaborated in a hierarchical manner:

- Each objective is elaborated to form a list of career development themes.
- Themes are elaborated to form unit-specific goal statements.
- Each goal statement is translated into one or more performance objectives.

Interpretability of measures. There are 141 performance objectives across the 27 units. Tests of the attainment of these objectives are administered before and again after the unit is taught. The tests were developed by the teachers who designed the curriculum units and were revised over the three-year development period on the basis of pilot and field test results. The tests have high face validity in that

Categories and Levels of Funding for Project CDCC*

INSTALLATION (Non-recurring Costs):	Staff Training (1 teacher)	$60-90	
	Curriculum Units	6	(Units at levels K-5 are $1.50 each; 6th grade units are $2.00 each.)
	Commercial Materials	0-20	(depending on LEA resources already available)
	TOTAL	$66 - 116	
YEARLY USAGE COSTS (Recurring Costs):	Miscellaneous materials and supplies	$ 9.60	
	Printing of activity/evaluation sheets for 24 students	12.00	
	Field trips, two per year (Varies, depending on LEA transportation costs and field trips taken)		
	TOTAL	$21.60 + cost of field trips	

*Note: All cost figures are based on a unit of intervention that includes 1 teacher and 24 students.

they are closely related to the unit content.

At the end of the third year of the project (1974-75), the decision was made jointly by the Coloma project and the Michigan Department of Education to seek a site where the effectiveness of these materials could be tested.

School personnel from Centreville, another town in southwestern Michigan, had previously approached Project CDCC personnel to express their interest in beginning some organized career development activities of their own; since Centreville resembled Coloma in important aspects (especially in a strong agribusiness base and the ethnic and socioeconomic makeup of the community), Centreville was selected as the experimental* site.

The town of Mendon, located eight miles from Centreville, was contacted regarding its willingness to serve as a control site. The Mendon Community Schools agreed to act in this capacity, testing one classroom per grade level. The class selected for testing a particular unit was alternated among the two or three classes at each grade level to reduce the respondent burden for any given class at the control site.

During the 1975-76 school year, the Coloma Community Schools continued to use the curriculum materials in all K-6 classrooms in its three elementary schools, which were designated field test sites. With project staff serving as coordinators, the same materials were used at the same grade levels in the Centreville elementary school, the experimental site, in the same manner as they were used in Coloma. Mendon elementary students took the unit tests on a pre-post basis, serving as the control site. Centreville staff received three days of training during the week before school started; approximately three teachers per grade level participated in the group training.

*The term "experimental" is used in a non-technical sense to designate that site where program effectiveness was to be tested.

Makeup and Comparability of Evaluation Samples. The five participating schools offered similar educational programs, had similar educational policies, and were alike in other relevant factors. The following demographic data illustrate the comparability of the field test, experimental, and control sites.

Comparative Demographic Information

	Field Test Site (Coloma)	Experimental Site (Centreville)	Control Site (Mendon)
Location	Southwest Michigan	Southwest Michigan	Southwest Michigan
K-12 Enrollment	3,108	935	945
Number of Teachers	132	44	47
Number of Students per Teacher	24	21	20
State Equalized Valuation per Student	$18,836	$16,514	$20,223
Total Tax Mills	23.376	24.500	23.000
$ Spent per Child	$ 1,224	$ 1,292	$ 1,148
Curriculum Type	Traditional self-contained classroom with grouping for reading and math	Traditional self-contained classroom with grouping for reading and math	Traditional self-contained classroom with grouping for reading and math
Community Classification	Primarily middle-class rural	Primarily middle-class rural	Primarily middle-class rural
Occupational Orientation	Agribusiness and industry	Agribusiness and industry	Agribusiness and industry

Comparability of the three sites in terms of academic achievement can be determined by reviewing data from the Michigan Educational Assessment Program. This yearly statewide testing program includes objectives-referenced tests in reading and mathematics at the fourth-grade level. The data below are scores from the fall 1974 testing for Centreville and Mendon and from the fall 1973 testing for Coloma (this seems to be the most appropriate comparison, since the CDCC units were introduced in Coloma during the 1973-74 school year).

State Assessment Results

Percentage of 4th-grade Students Attaining 75% or more of State Objectives

Coloma (N ≈ 240)		Centreville (N ≈ 80)		Mendon (N ≈ 80)	
Reading	Math	Reading	Math	Reading	Math
35.2	63.6	46.4	69.6	41.8	70.1

Unit tests. The CDCC units are evaluated using objectives-referenced, primarily paper-and-pencil tests; observational checklists are used to assess achievement on some of the performance objectives. In all cases the tests were administered and

checklists completed by the classroom teacher. Instructions to teachers on administering the unit evaluation are given in each unit; these call for the teacher to read the directions aloud, but all questions are to be read and responded to in writing by students themselves. Project staff mailed unit evaluations to the control school at various times throughout the year, corresponding to when the units were being taught and tests were being administered at the treatment schools. Tests were administered in treatment and control schools at the same time.

Credibility of Evidence. Aware that test results might be attributed to teacher bias in administering and scoring the tests, project staff introduced the following procedures to reduce that possibility. Procedures for administering unit evaluations were addressed during the inservice training. Follow-up assistance was given by the project coordinator, who occasionally spot-checked the administration of tests during her visits to schools. Teachers scored tests and recorded results for their own students; the project coordinator checked the scoring for all five schools. At this time she routinely inspected student answers for possible indications of bias in test administration. All teachers were required to sign verification sheets that the tests were administered in an objective manner. A validation team from the Michigan State Department of Education concluded that the data had been carefully collected and handled; all data calculations that were checked were confirmed to be correct. In all, there appears to be no reason to suspect biased test administration and no doubt as to the accuracy of the data tabulation and analysis.

Whenever possible, all students were pre- and posttested. However, for some of the test items it was not practical to collect pretest measures. For example, this is one of the performance objectives for the kindergarten unit entitled Inside Me, which focuses on self-awareness: "The student will demonstrate an awareness of the feelings found in himself/herself, as measured by the completion of a 'feelings' booklet." This objective was not pretested since it was unlikely that students would be able to achieve the objective prior to instruction.

There were substantial differences in posttest performance between experimental and control groups in favor of the former; to substantiate this impression, statistical analyses were computed by AIR. For every objective, chi-squares have been calculated between the Mendon control group and the Centreville experimental group. A separate chi-square was computed for the pretest and posttest results on each objective. The intent was to ascertain the number of cases in which a nonsignificant difference on the pretest was coupled with a significant difference on the posttest in favor of the Centreville experimental group.

As stated above, there are 141 performance objectives for the entire K-6 program. Of these, 83 have pretest and posttest data from Centreville and Mendon; 24 have posttest data only. The remaining 34 objectives have no data from the Mendon control group. These objectives were so specific to the unit content that there was no point in testing them at the control school. For example, the previously cited performance objective for the kindergarten unit Inside Me was not tested at Mendon; it did not seem justifiable to ask students to make a "feelings" booklet without receiving the accompanying instruction. The table that begins on the following page presents the chi-squares and significance levels for differences in objective achievement between the experimental (Exp) and control (Con) groups, as measured by the objective-referenced unit tests.

Statistical Reliability of Effects. As this table shows, of the 83 objectives with pre- and posttest data available, 39 have non-significant pretest differences and a significant posttest difference in favor of the experimental group. Thirty objectives have non-significant differences on both the pre- and posttest; however, 22 of those 30 objectives show larger increases in the Centreville students' achievement than in that of the Mendon students. In other words, change in performance was in the right direction, although it was not great enough to result in a significant difference at the time of posttesting.

OBJECTIVE-REFERENCED TEST RESULTS

Objective*		N Pre	N Post	% Achieving Obj. Pre	% Achieving Obj. Post	χ^2 Pre	χ^2 Post
1.12	Exp	71	67	15%	99%	.008	55.902**
	Con	29	28	14%	25%		
1.22	Exp		66		100%		44.905**
	Con		28		32%		
2.12	Exp		73		100%		18.903**
	Con		28		71%		
2.22	Exp		73		100%		13.017**
	Con		28		79%		
2.32	Exp		65		94%		18.639**
	Con		28		54%		
2.42	Exp		70		100%		70.629**
	Con		28		18%		
3.11	Exp	68	71	44%	97%	12.038**	72.77**
	Con	26	29	4%	10%		
3.21	Exp	68	71	7%	94%	22.409**	25.504**
	Con	26	29	54%	48%		
4.11	Exp	62	68	76%	100%	5.351**	24.353**
	Con	27	27	48%	63%		
4.21	Exp	64	68	66%	100%	.000	9.837**
	Con	27	27	63%	81%		
5.11	Exp	80	77	9%	73%	.003	33.12**
	Con	26	28	8%	7%		
5.23	Exp		77		100%		90.112**
	Con		28		7%		
5.32	Exp		77		100%		19.928**
	Con		28		71%		
6.11	Exp	76	77	50%	90%	.084	11.935**
	Con	25	25	56%	56%		
6.21	Exp	76	77	62%	77%	1.098	.249
	Con	25	25	76%	84%		
6.31	Exp	76	78	55%	97%	2.570	12.336**
	Con	25	25	77%	72%		
6.41	Exp	76	78	84%	95%	1.123	1.790
	Con	25	25	72%	84%		
7.11	Exp	79	75	58%	92%	1.54	18.337**
	Con	18	19	67%	47%		
7.21	Exp	79	74	53%	82%	.006	5.875**
	Con	18	19	56%	53%		
7.31	Exp	79	75	61%	98%	.019	15.971**
	Con	18	19	56%	68%		
8.12	Exp		42		100%		7.439**
	Con		22		77%		
8.22	Exp		42		100%		7.439**
	Con		22		77%		
8.32	Exp		42		100%		47.533**
	Con		22		14%		
8.42	Exp		41		100%		5.195**
	Con		22		82%		
8.52	Exp		42		100%		16.751**
	Con		22		59%		
9.11	Exp	51	59	51%	97%	.664	11.744**
	Con	20	24	65%	67%		
9.21	Exp	51	59	25%	83%	2.625	20.180**
	Con	20	24	5%	29%		
9.31	Exp	51	59	65%	90%	7.578**	28.386**
	Con	20	24	24%	29%		
9.41	Exp	51	59	41%	53%	.000	.097
	Con	20	24	45%	46%		

Objective*		N Pre	N Post	% Achieving Obj. Pre	% Achieving Obj. Post	χ^2 Pre	χ^2 Post
10.11	Exp	44	44	91%	100%	.283	5.521**
	Con	24	22	83%	32%		
10.21	Exp	44	44	45%	70%	4.445**	.417
	Con	24	22	17%	59%		
10.31	Exp	44	44	89%	95%	.483	.033
	Con	24	22	79%	91%		
10.41	Exp	44	44	25%	68%	5.432**	26.582**
	Con	24	24	0%	0%		
11.11	Exp	57	57	65%	95%	.921	.157
	Con	22	23	50%	96%		
11.21	Exp	57	56	60%	96%	.195	14.361**
	Con	22	23	68%	61%		
11.31	Exp	57	56	38%	96%	.000	.143
	Con	22	23	91%	96%		
12.11	Exp	63	64	70%	84%	1.539	24.539**
	Con	22	21	86%	24%		
12.21	Exp	63	64	48%	63%	.442	6.227**
	Con	22	21	36%	29%		
12.31	Exp	60	64	40%	95%	1.413	2.623
	Con	22	21	23%	81%		
12.41	Exp	60	64	25%	58%	.097	.005
	Con	22	21	32%	62%		
13.13	Exp		56		82%		10.300**
	Con		25		44%		
13.23	Exp		56		80%		18.399**
	Con		25		28%		
13.32	Exp		52		100%		3.683
	Con		25		88%		
13.42	Exp		52		100%		3.683
	Con		25		88%		
13.52	Exp		52		100%		1.694
	Con		25		92%		
13.62	Exp		52		98%		.437
	Con		25		92%		
14.11	Exp	65	66	8%	26%	.540	2.340
	Con	20	20	0%	5%		
14.21	Exp	65	67	14%	55%	.056	1.776
	Con	20	20	15%	35%		
14.31	Exp	65	66	34%	97%	1.787	55.249**
	Con	20	20	15%	15%		
14.41	Exp	65	67	26%	54%	.035	1.908
	Con	20	21	25%	33%		
14.51	Exp	65	66	17%	38%	.944	.013
	Con	20	21	5%	33%		
15.11	Exp	54	53	48%	58%	.196	.322
	Con	21	19	57%	47%		
15.21	Exp	54	53	29%	36%	.145	1.963
	Con	20	19	20%	58%		
15.31	Exp	55	53	9%	30%	.761	.031
	Con	20	19	0%	32%		
16.11	Exp	64	61	30%	[illegible]	.003	24.999**
	Con	23	21	26%	[illegible]		
16.21	Exp	64	61	23%	[illegible]	2.935	7.207**
	Con	23	21	4%	38%		
16.31	Exp	64	61	9%	49%	.069	11.288**
	Con	22	21	5%	5%		
16.41	Exp	64	62	56%	97%	4.403**	14.859**
	Con	22	21	27%	62%		

Objective*	N Pre	N Post	% Achieving Obj. Pre	% Achieving Obj. Post	X^2 Pre	X^2 Post
16.52 Exp		61		98%		.316
Con		21		100%		
17.13 Exp		45		96%		.044
Con		21		100%		
17.23 Exp		45		93%		.333
Con		21		100%		
17.33 Exp		45		64%		4.405**
Con		21		33%		
17.43 Exp		45		91%		21.273**
Con		21		33%		
18.11 Exp	60	63	48%	73%	.044	13.991**
Con	19	21	42%	24%		
18.21 Exp	60	63	38%	63%	3.365	13.365**
Con	19	21	21%	14%		
18.31 Exp	59	63	71%	86%	.004	2.573
Con	19	21	68%	67%		
18.41 Exp	59	63	59%	76%	1.096	1.944
Con	19	21	42%	57%		
18.51 Exp	59	63	42%	71%	.061	4.424**
Con	19	21	42%	45%		
18.61 Exp	59	63	8%	54%	.001	8.517**
Con	19	21	5%	14%		
18.71 Exp	60	63	55%	92%	1.060	2.420
Con	19	21	68%	76%		
19.11 Exp	50	52	26%	40%	.144	.471
Con	24	24	33%	29%		
19.21 Exp	50	52	52%	69%	7.353**	1.035
Con	24	24	88%	83%		
19.31 Exp	50	52	52%	94%	6.827**	2.923
Con	23	24	87%	75%		
19.41 Exp	50	52	74%	88%	2.076	1.229
Con	24	23	54%	48%		
20.12 Exp	70	69	77%	97%	4.457**	22.673**
Con	25	11	52%	45%		
20.22 Exp		69		72%		4.111**
Con		11		36%		
20.32 Exp	70	68	53%	97%	6.785**	24.247**
Con	25	29	20%	54%		
20.42 Exp	70	68	24%	66%	.750	4.946**
Con	25	28	36%	39%		
21.11 Exp	54	53	48%	85%	4.466**	11.179**
Con	28	26	21%	46%		
21.21 Exp	54	53	89%	96%	.004	.040
Con	28	26	86%	92%		
21.31 Exp	54	53	9%	55%	.240	11.762**
Con	28	26	4%	12%		
21.41 Exp	54	53	0%	23%	---	5.756**
Con	28	28	0%	0%		

Objective*	N Pre	N Post	% Achieving Obj. Pre	% Achieving Obj. Post	X^2 Pre	X^2 Post
21.51 Exp	54	53	22%	68%	3.511	26.248**
Con	28	26	4%	4%		
22.11 Exp	66	70	58%	61%	2.571	7.314**
Con	25	23	36%	26%		
22.21 Exp	66	70	17%	70%	.025	7.526**
Con	28	23	18%	35%		
22.31 Exp	66	70	23%	33%	.424	1.329
Con	28	23	14%	17%		
22.41 Exp	66	70	58%	70%	.058	10.736**
Con	25	24	52%	29%		
22.51 Exp	66	70	30%	61%	.063	14.335**
Con	23	23	30%	13%		
23.13 Exp	49	51	27%	49%	3.159	.025
Con	26	25	50%	54%		
23.22 Exp	49	51	16%	27%	1.222	5.510**
Con	24	21	4%	0%		
24.11 Exp	67	65	4%	83%	.128	46.013**
Con	23	23	0%	0%		
24.21 Exp	67	65	4%	88%	.128	48.876**
Con	23	23	0%	4%		
24.33 Exp	67	65	19%	68%	.747	15.387**
Con	23	23	9%	17%		
24.42 Exp	67	65	15%	48%	.014	5.308**
Con	23	23	13%	17%		
25.12 Exp	66	63	15%	17%	.128	.199
Con	22	20	9%	10%		
25.22 Exp	66	63	0%	70%	---	25.989*
Con	22	20	0%	0%		
25.32 Exp	67	63	0%	84%	---	42.976**
Con	22	20	0%	0%		
25.42 Exp	64	63	31%	49%	.319	.037
Con	22	20	41%	50%		
26.11 Exp	62	66	47%	64%	.191	1.362
Con	21	19	38%	47%		
26.21 Exp	62	66	3%	17%	.122	.903
Con	21	20	5%	5%		
26.31 Exp	62	66	2%	55%	.362	16.589*
Con	21	20	0%	0%		
26.41 Exp	62	65	42%	52%	11.941**	.549
Con	23	20	87%	65%		
26.51 Exp	62	65	56%	89%	19.803**	52.140**
Con	23	20	0%	0%		
26.61 Exp	65	65	15%	48%	2.311	5.516*
Con	21	20	0%	15%		
26.71 Exp	65	65	77%	86%	.047	3.201
Con	21	20	71%	65%		
26.81 Exp	62	65	45%	57%	1.153	1.187
Con	21	18	62%	39%		
26.91 Exp	62	66	5%	29%	.330	3.324
Con	21	19	5%	5%		

*Objectives are coded by unit; for example, Objective 1.12 is a performance objective for the first unit in the series, Me. Within that unit, it is the first objective for which there are data from both Centreville and Mendon. The last digit (2) indicates that it relates to the second major project objective--formulating a realistic self-concept. (One first-grade unit, Friendship, was omitted from the table, as no data were collected from Mendon for any of the objectives.)

**$p < .05$ if $x^2 \geq 3.841$, df 1

Note: Variation in N from pre- to posttest is primarily due to student attendance on the days tests were given; teachers were not required to give makeup tests.
Exp = Centreville students Con = Mendon students

Ten objectives show significant differences on both the pre- and posttest; in each of these cases the posttest chi-square is in favor of the experimental group. Four objectives show a significant difference on the pretest and a non-significant difference on the posttest; in three of these cases the percentage of experimental students achieving the objective increased by at least 10%, while the achievement percentage of control students declined. Of the 24 objectives having only posttest comparisons, 17 showed a significant difference in favor of the experimental group, and the others were not significant.

Developmental Effects. Further important evidence of program impact lies in the comparison of percentages of objective achievement for the Centreville experimental group, with one year of exposure to CDCC units, and the Coloma field test group, which had been exposed to CDCC materials for up to four years. Since Coloma students usually had higher pretest scores than Centreville students, significance tests were not done. Percentages on the posttests, however, show that out of 138 objectives for which data are available from both sites, Coloma students equal or surpass those from Centreville on 95. It should be noted that this higher performance is not due to practice effects. As Coloma students advanced through grades during the years 1972-76, they were exposed to a given unit only once. Therefore, their higher achievement reflects the units' cumulative effect. These results are strong evidence that project CDCC is an effective developmental program. Not only does it show results in one year, it also shows greater results at any grade level if the students have been involved with CDCC units at lower levels.

Evidence That Effects Are Attributable to the Intervention. Seventy-seven teachers taught the units in Centreville and Coloma; the fact that differences in objective achievement were obtained over a large number of teachers rules out teacher effects as the probable cause of differences. Use of a comparable control group offers assurance that neither maturation nor selection of a superior treatment group are causal factors. Rather, it can be inferred that the differential objective achievement is attributable to the learning experiences provided by the CDCC project.

Evidence That Effects Are Educationally Meaningful. Educational significance of these results cannot be gauged in terms of differences in standard deviation units on the performance measures because each was scored according to percent of students achieving the objective. Educational significance must be judged, instead, on the importance of Project CDCC's objectives; the fact that success in achieving these objectives was demonstrated over a one-year period and even greater success was shown in four years; the reasonable cost of implementing the program; and the relationship of successful results in career education to other types of results. Regarding the last point, some educators have expressed fear that time devoted to career education will be subtracted from time spent on teaching basic academic skills, causing lower results on achievement tests. The question of whether Project CDCC's activities had a positive or negative effect on academic achievement can be partially answered, at least, by reviewing data from the Michigan Educational Assessment Program collected prior to and following CDCC implementation. Results from the statewide assessment program are given on the next page for Coloma (Fall'73 = pre-intervention; Fall '74 = post) and for Centreville and Mendon (Fall '75 = pre-intervention; Fall '76 = post).

State Assessment Results

Percentage of students attaining 75% or more of objectives

	4th Math			4th Reading			7th Math				7th Reading			
Fall	Coloma		State	Coloma		State	Coloma		State		Coloma		State	
73	63.6		67.0	35.2		38.5	39.2		43.1		41.2		50.0	
74	85.3		74.1	60.8		48.6	44.4		47.6		52.6		55.3	
	Ce	M	S	Ce	M	S	Ce	M	Co	S	Ce	M	Co	S
75	72.3	74.6	78.7	46.2	49.2	52.5	68.9	50.0	60.0	56.5	59.5	57.7	54.3	57.4
76	88.7	83.9	80.0	52.1	56.5	56.4	66.7	43.3	50.9	53.8	62.3	55.2	58.1	56.4

KEY: Ce = Centreville M = Mendon Co = Coloma S = State

Following is a summary of the gain between '73 and '74 testing for Coloma and the state as a whole:

4th Math		4th Reading		7th Math		7th Reading	
Coloma	State	Coloma	State	Coloma	State	Coloma	State
21.7%	7.1%	25.6%	10.1%	5.2%	4.5%	11.4%	5.3%

It can be seen that the percentage of students achieving state assessment objectives increased by a much larger amount for Coloma fourth-grade students than for the state as a whole. The percentage increase in math was three times the statewide increase, while the reading increase was 2 1/2 times as great. In both subject areas Coloma students advanced from scores below the statewide average to scores above the state average. Coloma seventh-graders also showed greater gains in reading and math than those for the state as a whole.

Folowing is a summary of the gain between '75 and '76 testing for Centreville, Mendon, and Coloma (at the seventh-grade level only), compared to the state as a whole:

4th Math			4th Reading			7th Math				7th Reading			
Ce	M	S	Ce	M	S	Ce	M	Co	S	Ce	M	Co	S
16.4%	9.3%	1.3%	5.9%	7.3%	3.9%	-2.2%	-6.7%	-9.1%	-2.7%	2.8%	-2.5%	3.8%	-1.0%

After one year of exposure to the CDCC units, the same sort of result was obtained for Centreville fourth-grade students as had been found earlier at Coloma; i.e., the percentage of students achieving state assessment objectives increased by a larger amount (in math, by a much larger amount) for Centreville students than for the state as a whole. The Mendon students, who were not exposed to the units, showed a smaller achievement increase in math, although they achieved slightly more in reading. During the one-year interval from Fall '75 to Fall '76, there was a general decline in seventh-grade achievement throughout the state. After exposure to the CDCC units, Centreville students' scores declined by a smaller amount than statewide scores or those of Mendon students. As in the 73-74 results, a greater gain is found in reading. While statewide and Mendon scores declined, Centreville students increased their achievement, and Coloma students increased by an even larger amount (note that part of this cohort, which was in the sixth grade during the 1975-76 school year, had been exposed to CDCC materials for four years). The Coloma students advanced from ranking below the statewide reading average to above-average status; Centreville students maintained their above-average rank, while Mendon students dropped below the state average.

In summary, though these data do not prove that Project CDCC improves students' academic skills (because no attempt was made to match the schools on types of academic programs offered), they appear to lay to rest the fear that implementing career education activities will hurt academic achievement.

Evidence of Generalizability. Project CDCC has been awarded an ESEA Title IV-C grant to provide training and materials for successful program adoption/adaptation. It is currently being replicated at other locations throughout the state of Michigan. Its positive results in Centreville as well as its successful operation in Coloma over a period of four years provide a strong indication that the project will be generalizable to other similar communities and school populations.